

IN THE CLAIMS

The following claim set replaces all prior versions, and listings, of claims in the application:

1 – 13 (Canceled)

14. (New) An apparatus for separation of solids in froth, comprising:

a housing, delimited by two upper side walls, two upper end walls and a mainly funnel shaped bottom, the housing establishing a chamber for flows of liquid and solid material and a froth bed on the liquid;

feeding means for getting incoming material to be separated in contact with said froth bed;

discharging means for solid material near the bottom of said housing;

aerator means under the liquid surface for creating bubbles and thus forming said froth bed on the liquid in the apparatus, said aerator means being constructed to generate a vertical flux of bubbles substantially nonhomogenous in a horizontal cross-section of the chamber, to generate a moving bed of froth on the liquid;

means for discharging froth from the housing including at least a froth outlet;

a surface connected to said feeding means so as to reduce the vertical speed component of the material being fed with the feeding means along which surface the material being fed is introduced from above said froth bed in and on to said froth bed; and

one or more vertical plates installed inside the chamber substantially parallel to the direction of the froth motion, wherein

said aerator means comprises a main bubble generator and at least one additional bubble generator, said main and at least one additional bubble generators being installed at least partly one above another, each of the

main and at least one additional bubble generators by itself creating in the horizontal cross-section a homogenous flow of bubbles, the main bubble generator covering substantially the whole length of a horizontal section of the chamber in the direction of the froth motion, and the at least one additional bubble generator covering two-thirds or less of the length of the chamber in the direction of the froth motion starting from the start point of the horizontal froth motion.

15. (New) An apparatus for separation of solids in froth, comprising:

a housing, delimited by two upper side walls, two upper end walls and a mainly funnel shaped bottom, the housing establishing a chamber for flows of liquid and solid material and a froth bed on the liquid;

feeding means for getting incoming material to be separated in contact with said froth bed;

discharging means for solid material near the bottom of said housing;

aerator means under the liquid surface for creating bubbles and thus forming said froth bed on the liquid in the apparatus, said aerator means being constructed to generate a vertical flux of bubbles substantially nonhomogenous in a horizontal cross-section of the chamber, to generate a moving bed of froth on the liquid;

means for discharging froth from the housing including at least a froth outlet;

a surface connected to said feeding means so as to reduce the vertical speed component of the material being fed with the feeding means along which surface the material being fed is introduced from above said froth bed in and on to said froth bed; and

one or more vertical plates installed inside the chamber substantially parallel to the direction of the froth motion, wherein said plates cover substantially the whole length of a horizontal section of the chamber.

16. (New) An apparatus for separation of solids in froth, comprising:
- a housing, delimited by two upper side walls, two upper end walls and a mainly funnel shaped bottom, the housing establishing a chamber for flows of liquid and solid material and a froth bed on the liquid;
 - feeding means for getting incoming material to be separated in contact with said froth bed;
 - discharging means for solid material near the bottom of said housing;
 - aerator means under the liquid surface for creating bubbles and thus forming said froth bed on the liquid in the apparatus, said aerator means being constructed to generate a vertical flux of bubbles substantially nonhomogenous in a horizontal cross-section of the chamber, to generate a moving bed of froth on the liquid;
 - means for discharging froth from the housing including at least a froth outlet;
 - a surface connected to said feeding means so as to reduce the vertical speed component of the material being fed with the feeding means along which surface the material being fed is introduced from above said froth bed in and on to said froth bed;
 - one or more vertical plates installed inside the chamber substantially parallel to the direction of the froth motion, and
 - a flat parallel electrode system for electrolysis installed under the aerator means.
17. (New) An apparatus for separation of solids in froth, comprising:
- a housing, delimited by two upper side walls, two upper end walls and a mainly funnel shaped bottom, the housing establishing a chamber for flows of liquid and solid material and a froth bed on the liquid;
 - feeding means for getting incoming material to be separated in contact with said froth bed;
 - discharging means for solid material near the bottom of said housing;

aerator means under the liquid surface for creating bubbles and thus forming said froth bed on the liquid in the apparatus, said aerator means being constructed to generate a vertical flux of bubbles substantially nonhomogenous in a horizontal cross-section of the chamber, to generate a moving bed of froth on the liquid;

means for discharging froth from the housing including at least a froth outlet;

a surface connected to said feeding means so as to reduce the vertical speed component of the material being fed with the feeding means along which surface the material being fed is introduced from above said froth bed in and on to said froth bed; and

one or more vertical plates installed inside the chamber substantially parallel to the direction of the froth motion, wherein

said feeding means includes a primary chamber with an inclined perforated bottom, said primary chamber being connected to an inclined gutter divided by longitudinal partitions; said gutter being assembled to be vibrated during use, and wherein longitudinal sides of the gutter bottom are inclined downwards towards the chamber.

18. (New) An apparatus as in any one of claims 14-17, wherein said aerator means includes an aerator that is inclined downwards by an angle up to 30 degrees from a horizontal level in the direction of the froth motion.

19. (New) An apparatus as in any one of claims 14-17, further comprising a reflective plate installed above a part of the chamber where vertical flow of bubbles from the aerator means is at a maximum, said reflective plate being inclined upwards in the direction of the froth motion so that vertical motion of the rising bubbles is turned into a horizontal motion of the froth bed in a direction towards the froth outlet.

20. (New) An apparatus as in any one of claims 14-17, wherein the apparatus includes two or more chambers for flows of liquid and solid material and a froth bed on the liquid, said two or more chambers being partly separated from each other by at least one partition placed parallel to and between the two upper end walls, said two or more chambers being connected with each other by liquid.

21. (New) An apparatus as in any one of claims 14-17, wherein said feeding means is installed above an end wall or above a partition between the two end walls, said feeding means being installed so that the feed material from said feeding means is distributed substantially equally along the whole length of the said end wall or partition.

22. (New) An apparatus as in any one of claims 14-17, further comprising adjusting means for adjusting the amount of liquid discharged from the housing, to thereby enable adjustment of liquid level in the housing and/or to adjust the height of the froth bed.

23. (New) An apparatus as in any one of claims 14-17, further comprising a froth receiver installed at the froth outlet, said froth receiver having an inclined and at least partly perforated bottom.

24. (New) An apparatus as in any one of claims 14-17, wherein said feeding means includes a longitudinal edge disposed substantially transverse to the direction of the froth motion, said edge serving to increase contact area between the feed material and the froth bed, wherein feed material is transported over said edge to be fed in and on to the froth bed.

25. (New) An apparatus as in claim 24, wherein said longitudinal edge is comb-shaped with teeth pointing in the direction of the froth motion.

26. (New) An apparatus as in claim 15, 16 or 17, wherein said aerator means comprises a main bubble generator and at least one additional bubble generator, said main and at least one additional bubble generators being installed at least partly one above another,

each of the main and at least one additional bubble generators by itself creating in the horizontal cross-section a homogenous flow of bubbles, the main bubble generator covering substantially the whole length of a horizontal section of the chamber in the direction of the froth motion, and the at least one additional bubble generator covering two-thirds or less of the length of the chamber in the direction of the froth motion starting from the start point of the horizontal froth motion.

27. (New) An apparatus as in claim 14, 16, or 17, wherein said plates cover substantially the whole length of a horizontal section of the chamber.

28. (New) An apparatus as in claim 14, 15 or 17, further comprising a flat parallel electrode system for electrolysis installed under the aerator means.

29. (New) An apparatus as in claim 14, 15 or 16, wherein said feeding means includes a primary chamber with an inclined perforated bottom, said primary chamber being connected to an inclined gutter divided by longitudinal partitions; said gutter being assembled to be vibrated during use, and wherein longitudinal sides of the gutter bottom are inclined downwards towards the chamber.